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ABSTRACT

The scope of population research as carried on by the National Institute of Child Health and Human Development (NICHD) is set forth in this booklet. Population problems of the world, United States, and the individual are considered along with international population policies based on voluntary family planning programs. NICHD goals for biological and social science research are stated. A description of the Center for Population Research is provided, enumerating information concerning its contracts, grants, training, and federal leadership role. Also listed are additional institute activities. (BL)

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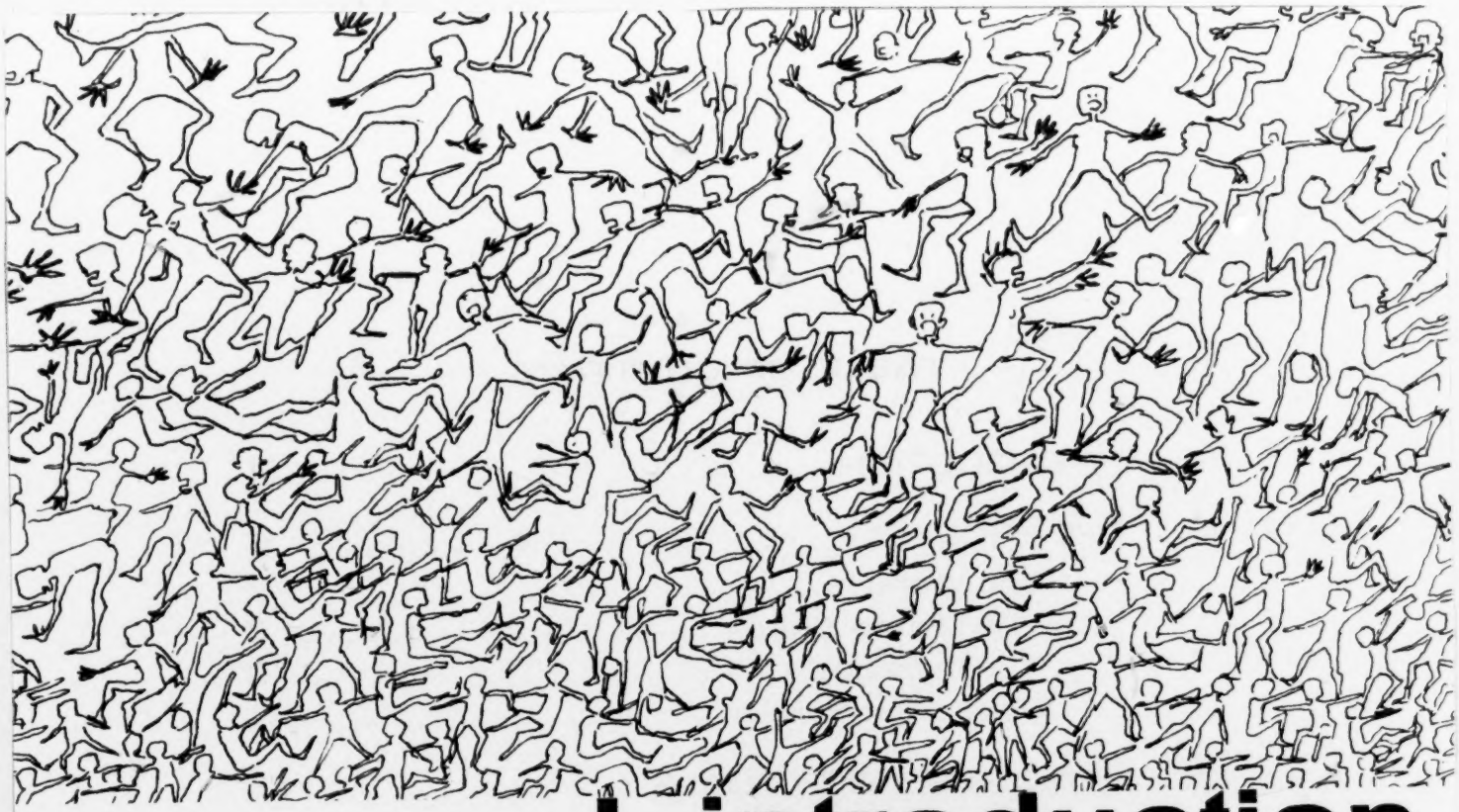


I. introduction

The problem of excessive population growth is critical—to the world, the United States, and to individuals. At present growth rates, the world population will be doubled to 7 billion by the year 2000. Nearly 5 billion would enter the 21st century even if the growth rate were cut in half right now. To a world of finite resources, infinite growth is unthinkable.

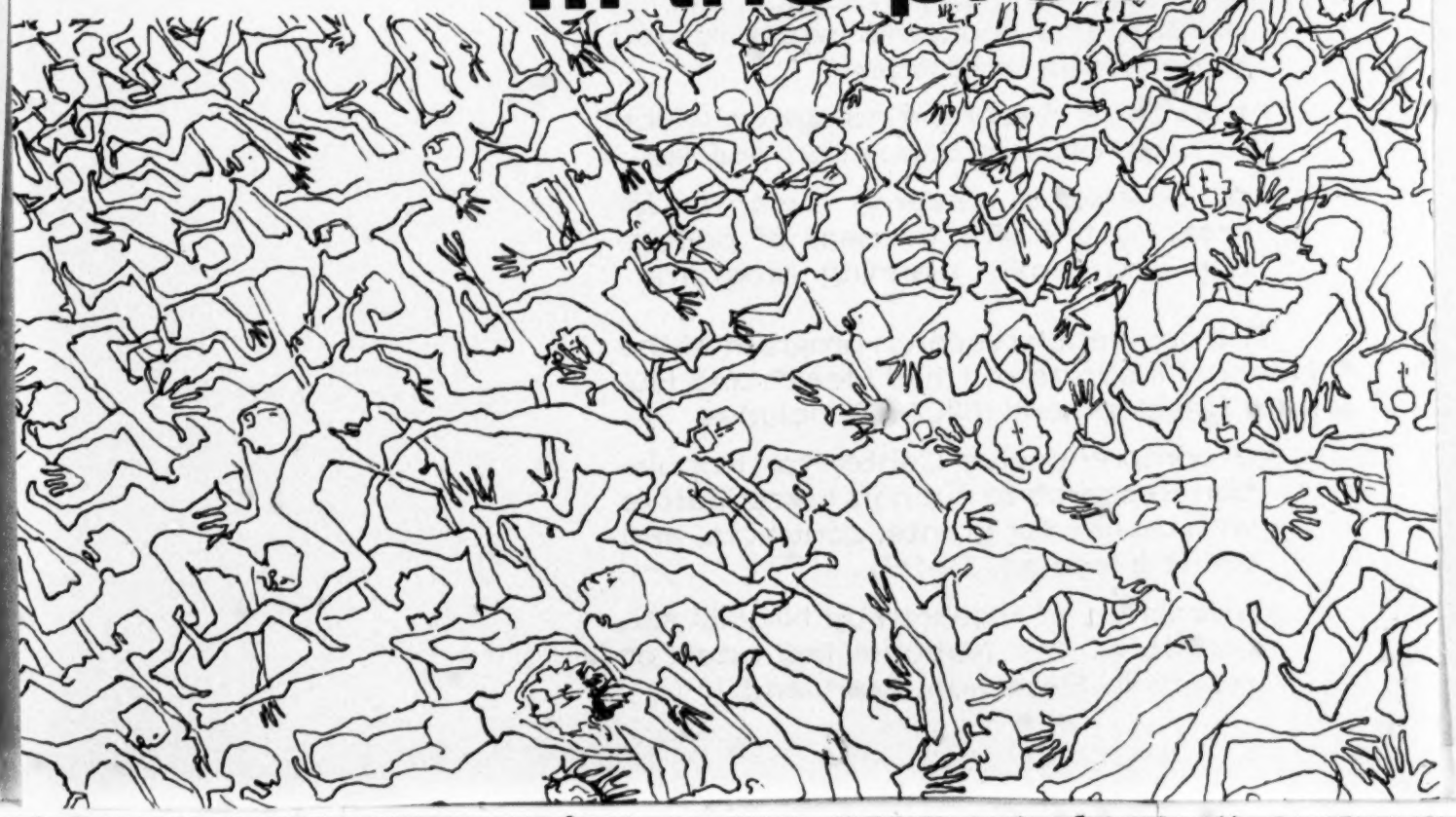
Population research is needed

- to find suitable contraceptives and the means of motivating people to use them
- to understand the reproductive process in full detail
- to evaluate existing contraceptives and their effects
- to analyze the psychological, social, political, and economic issues related to population problems
- to provide research findings on which to base rational population policies
- to develop a research base for increasing the effectiveness of population and family planning programs

The population research program of the National Institute of Child Health and Human Development (NICHD) includes

- a comprehensive Center for Population Research to support investigators who qualify for grants, contracts, and training (see pp. 19-27)
- a program of research by NICHD scientists at the National Institutes of Health in Bethesda, Maryland

II. the problem



the world

In many parts of the world the balance between numbers of people and the availability of resources is in serious jeopardy. The problem is particularly severe in the developing countries, where the number of people is rising faster than the amounts of food, housing, manufactured goods and services needed to improve levels of living. Public health measures that reduced death rates in these nations have accelerated population growth, making the reduction of high birth rates a more urgent need than ever before.

the united states

Several million American women lack either knowledge for controlling their fertility or access to adequate medical services. They produce about 450,000 unwanted children each year, suffer high rates of maternal illness and death, and

often resort to criminal abortions. Many of their children are illegitimate; many others die in their first year. Frequent pregnancies compound the difficulties of escaping poverty and of caring for the surviving children.

The country as a whole is faced with tremendous increases in numbers of children and young adults from the postwar baby boom. The increases are straining our social institutions and natural resources. As these postwar children mature, between 1969 and 1985, the number of women of reproductive age will rise by 34 percent. Their decisions about childbearing will affect the quality of life for all future generations.

the individual

The American ethic of free individual choice and equal opportunity gives special poignancy to population problems faced by individuals. Some Americans have more children than they want; others have them sooner than desired. These together constitute 57 percent of the married population of reproductive age; the proportion would be higher if all couples were able to bear children.

Giving these Americans the ability to make reliable choices—through improved contraceptive methods made widely available—is one goal of population research. Understanding what determines their choices, what effect these choices have on the quality and quantity of American life, and investigation of feasible national population goals are also primary NICHD concerns.

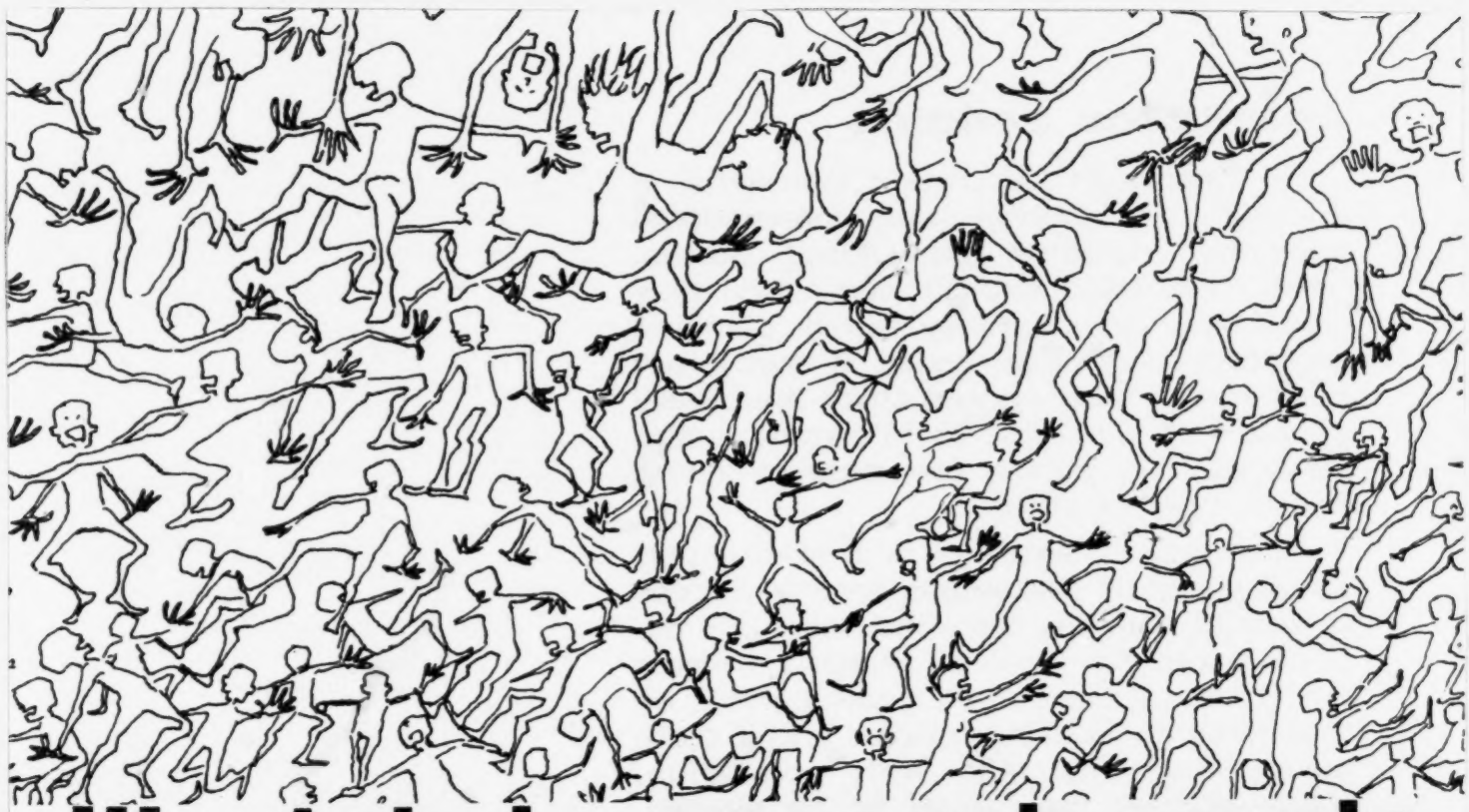
American population policy is that every child should be a wanted child; that every couple has the right to information and services that permit the desired timing and number of births. Formulating a scientific basis for public policy is the responsibility of population research.

Several million American women lack either knowledge for controlling their fertility or access to adequate medical services. Frequent pregnancies compound the difficulties of escaping poverty and caring for the surviving children. Giving Americans the ability to make reliable childbearing choices—through improved contraceptive methods made widely available—is one goal of population research. Understanding what determines their choices, what effect these choices have on the quality and quantity of American life, and investigation of feasible national population goals are also primary NICHD concerns. (photo courtesy of U.S. Department of Labor)

population policies

To deal with population problems, a number of countries and international agencies, including the United States, have formulated explicit population policies based on voluntary family planning programs. American policy is that every child should be a wanted child; that every couple has the right to information and services that permit the desired timing and number of births.

The implicit strategy is that the personal goals of individuals having access to family planning services will fulfill national population goals. If research reveals that national population goals cannot be reached with existing policies and if technology loses its race with population, these policies may have to be altered. Formulating a scientific basis for such decisions is the responsibility of population research.



III. nichd research goals

biological research

At any stage in the reproductive process—from the production and release of pituitary hormones initiating sperm and ovum formation, to implantation of the developing embryo in the uterus—it may be possible to alter the sequence of events and prevent pregnancy. Studies in reproductive biology—a well established research field—will form a solid base for evaluating existing contraceptives and developing new ones.

Emphasis is on

- basic research into normal and abnormal reproductive biology
- improving present contraceptive methods and understanding their genetic and biological implications
- increasing the ability of couples to control the size of their families or to have families, if they are infertile

The ideal contraceptive would be effective, safe, inexpensive, reversible, self-administered, and acceptable to various population groups. No existing method meets all these criteria. Probably no single method will be universally satisfactory; the goal of population research is to develop many contraceptives, suited to many kinds of people.

These might include

- a pill to be taken once a month
- an injection to be given once or twice a year
- a modern male method

- a simple means of detecting ovulation, to permit reliable periodic abstinence
- an improved intrauterine device

The development of new contraceptive methods is pursued through fundamental studies in such areas as

- maturation and fertilizing capacity of spermatozoa
- the biology of the pre-implantation ovum
- oviduct function and gamete transport
- corpus luteum function

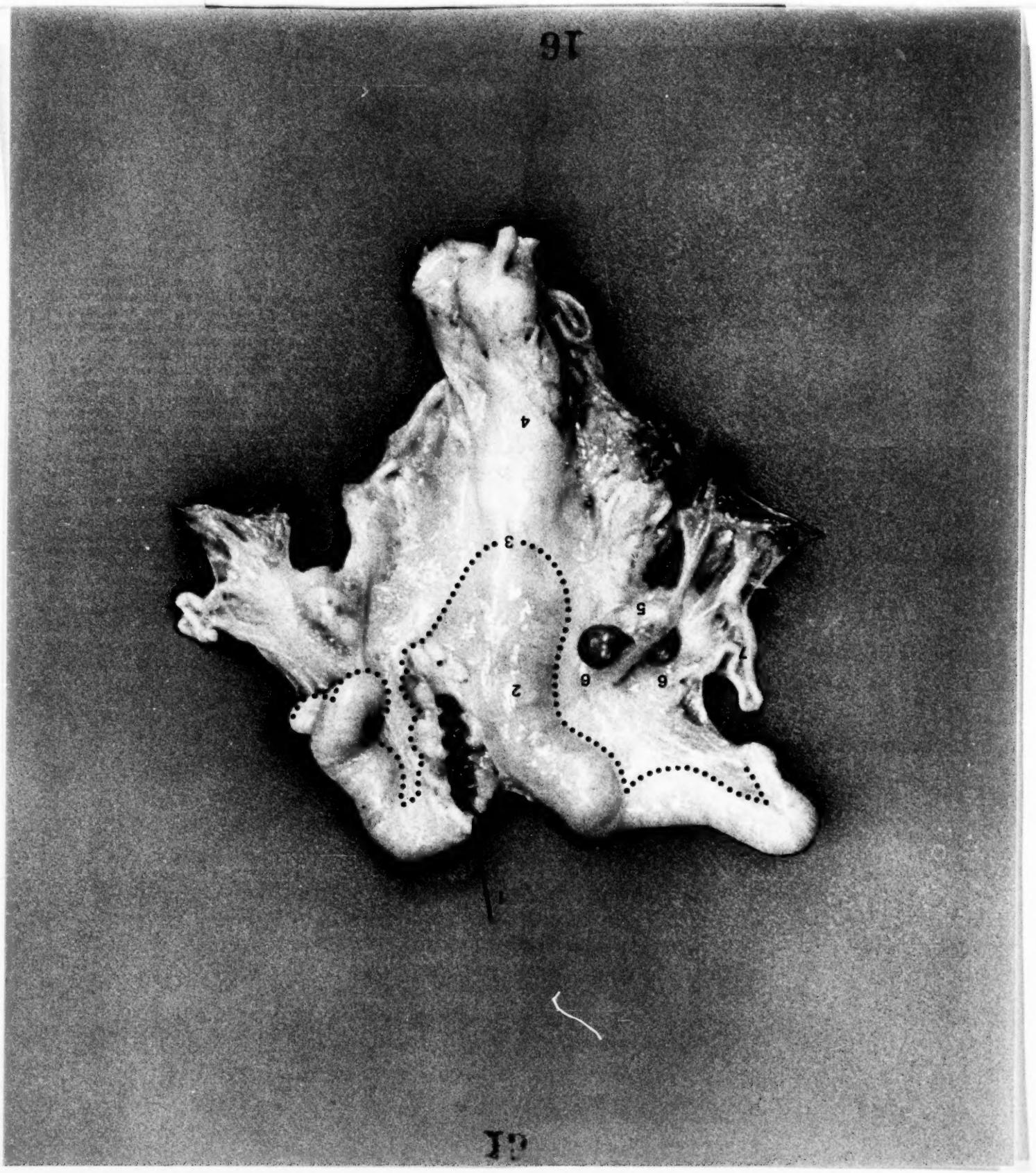
social science research

NICHD research in the social sciences assesses the important psychological, social, political, demographic, and economic issues related to population problems. Some topics of special interest are

- measurement and analysis of trends and differences in fertility
- control of fertility by contraception and abortion
- social and economic determinants and consequences of changes in population size and structure
- the relationship of childbearing patterns to family structure
- analysis of illegitimacy
- the impact of various action programs on population growth
- development of population policies

IUD IN REPRODUCTIVE SYSTEM OF THE EWE

Additional facts are needed before a better IUD can be developed for human use. Studies with NICHD support examine the way IUDs work in various animal species, for clues to how they work in humans. The IUD has been darkened for photographic contrast. 1) the coiled IUD exposed in one horn of a sheep uterus 2) sheep uterus (enclosed by dotted line) 3) cervix 4) vagina 5) ovary 6) corpus luteum (see also p. 16) and 7) oviduct.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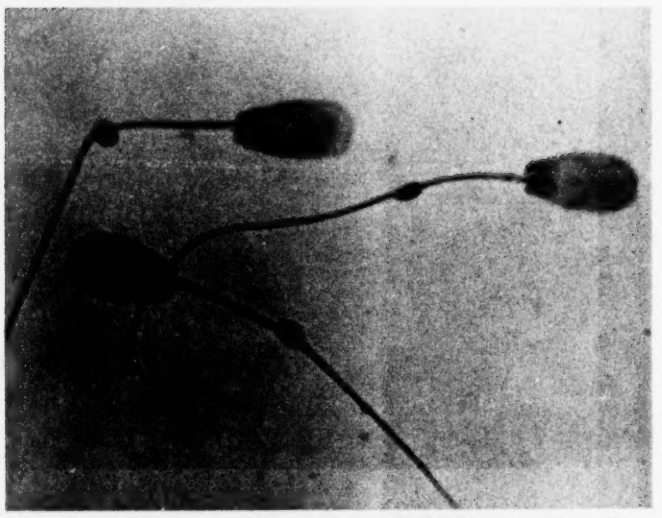

Figure 1
Pig Sperm

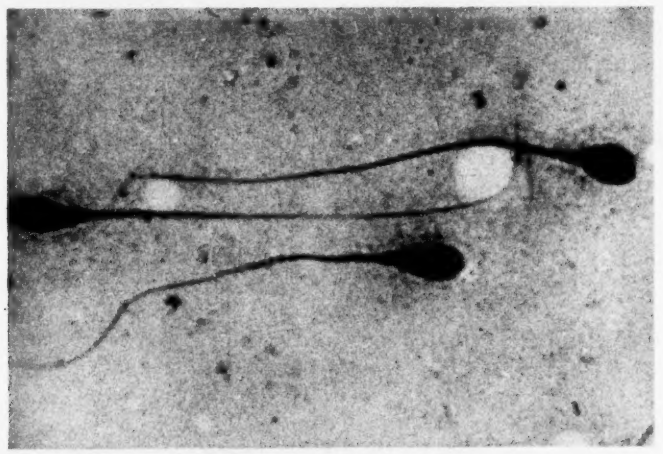

Figure 2
Human Sperm

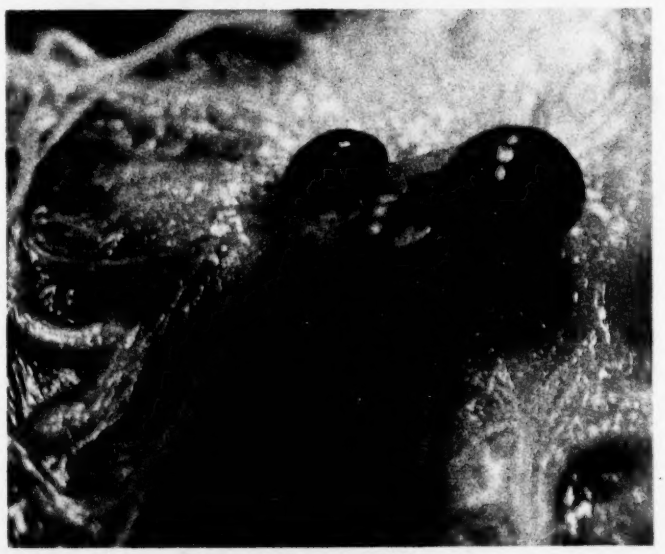

Figure 3
Sheep Ovary

CONTRACEPTIVE DEVELOPMENT

Figs. 1, 2. Modern male methods of contraception are sought partly through studies of sperm: their development and maturation; their passage through the male system; their motility; and development of their fertilizing capacity.

Fig. 3. Sheep ovary, showing two darkened corpora lutea. The corpus luteum, a progesterone producing structure, forms on the ovary shortly after ovulation and may be necessary to initiation and maintenance of pregnancy in primates. If so, a contraceptive might be developed which could inhibit corpus luteum function when taken once a month by a woman at the time of her expected period. Because of its simplicity, such a method would be particularly useful in family planning programs.

To influence population trends for the benefit of society and its individual members, we must first understand what determines these trends. Why, for example, do some groups maintain high fertility and others low? What personal and social values are responsible for childbearing patterns? How can reproductive choices be influenced without compulsion or penalties? As populations grow, preservation of humane and democratic values and the lowering of growth rates will become increasingly difficult, but the effort must be made on the basis of research.

Many serious social problems are related to migratory patterns—overcrowded cities, urban sprawl in suburban areas, and inadequate transportation between home and work. Migratory patterns, like fertility patterns, result from personal aspirations and social values which must be analyzed before they can be influenced effectively.

Individuals need information on which to base their childbearing decisions. For example, how do children in large families differ from those in small families? What effect does spacing of children have on their growth and development? How effective has contraception been for its users?

We know that population growth cannot continue indefinitely: the growth rate must eventually reach zero in any society. But without further research on the relationship of population to the quality of life, we have no rational basis for deciding when we should try to attain a stationary population.

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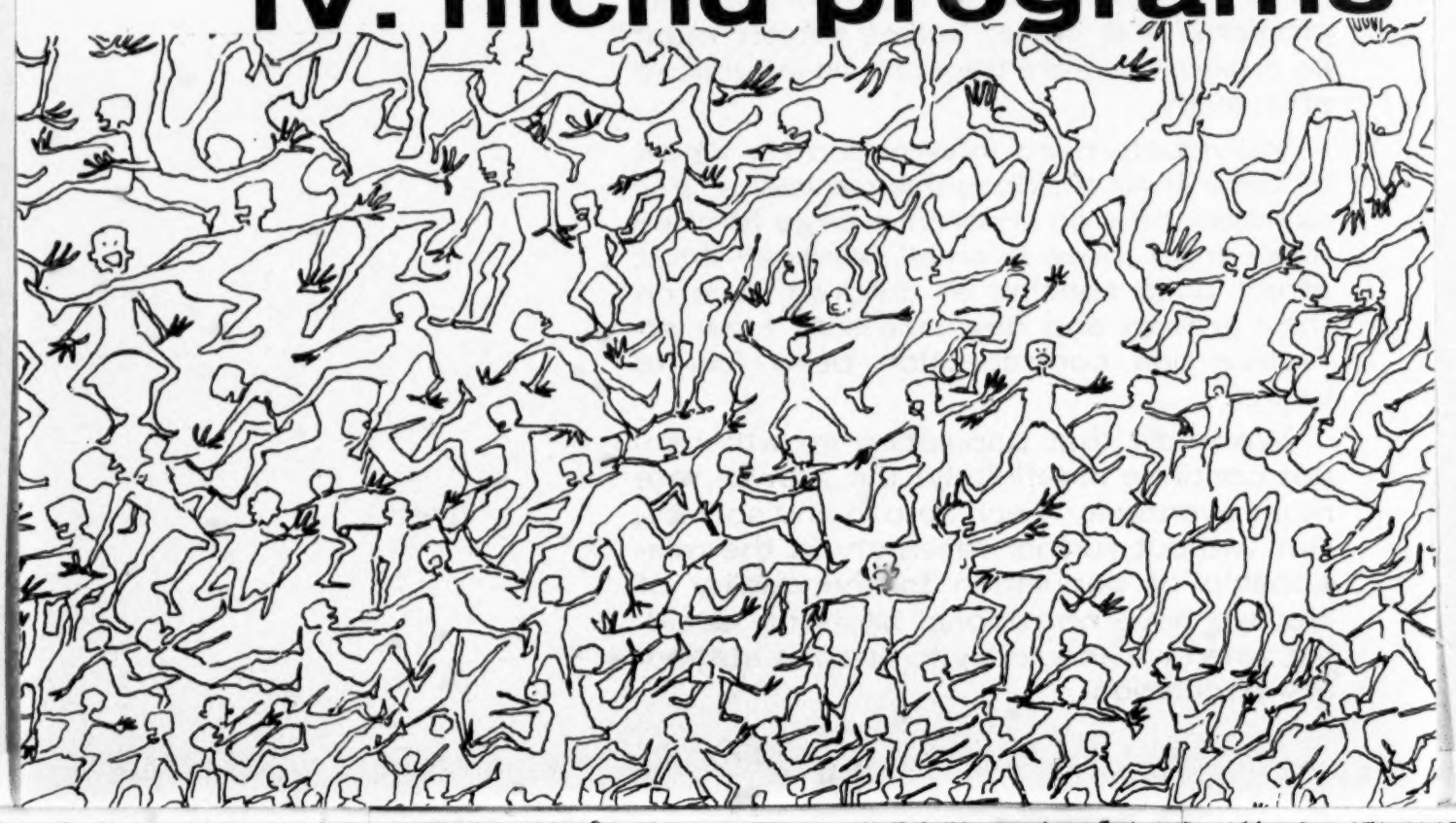
IV. nichd programs



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the center for population research

The Center fulfills a variety of functions for the NICHD and the Department of Health, Education, and Welfare. It supports research and research training through contracts, grants, symposia, fellowships and career awards, workshops and conferences. It keeps abreast of population research activities of Federal and private agencies, reporting on these periodically. It also coordinates the Federal program of population research, stimulating and advising other agencies and enlisting the cooperation of Federal and private sources in identifying and studying population problems.

Investigators may seek either contract or grant support of research projects. Guidance is available from Center staff, and inquiries are welcome.

Contracts

Contracts are employed when the Institute wishes to accomplish a specific, high priority research goal and maintain some control over the research. The NICHD initiates most research contract proposals and participates in their design, direction, and methodology. The Center supervises existing population contracts and negotiates new contracts through its **Contraceptive Development Branch** and its **Behavioral Sciences Branch.**

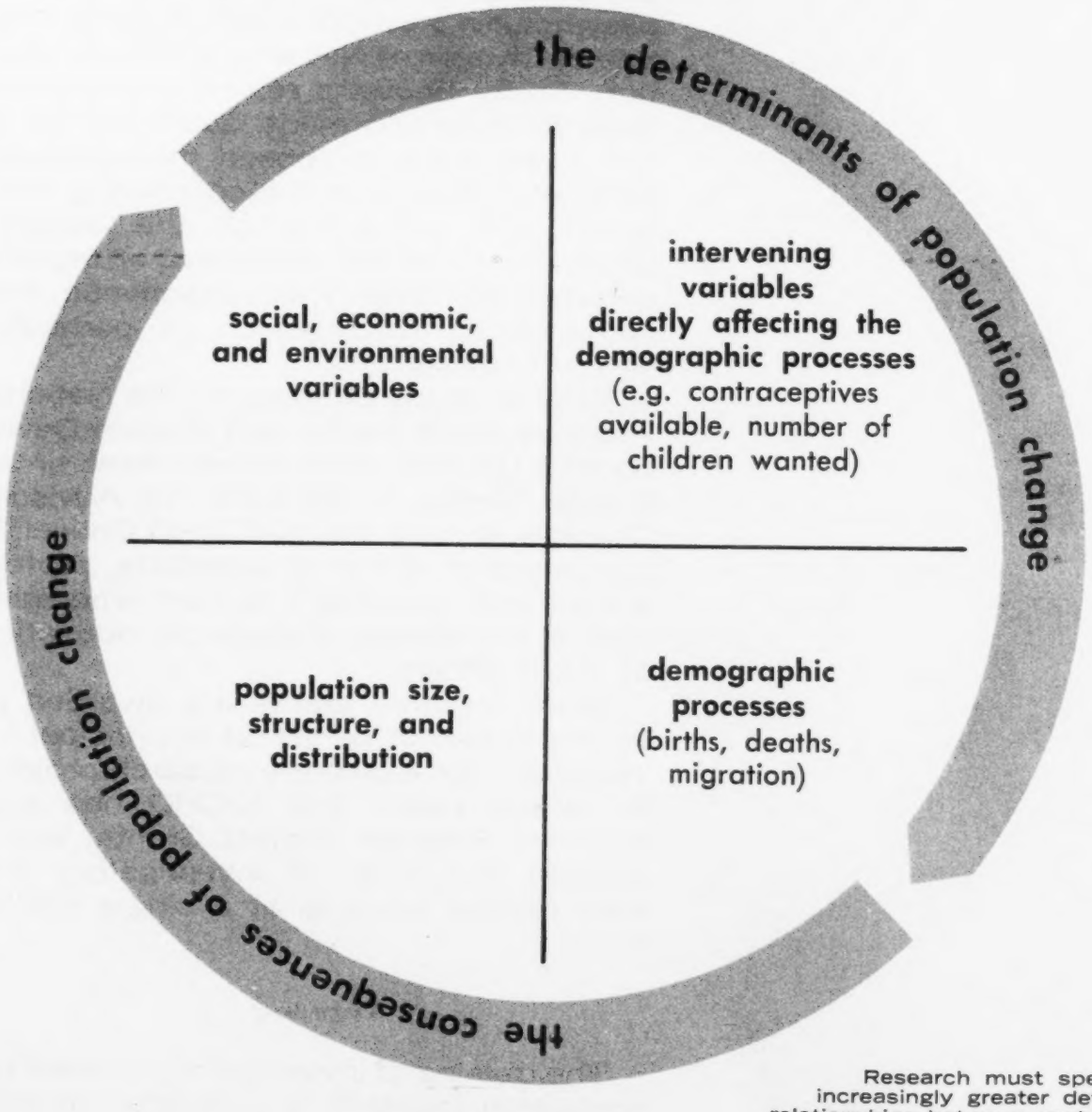
The Center has established ad hoc panels of scientists from within and outside the government to identify specific priority areas, review research proposals, and assist in the direction and surveillance of the contract program. New panels will be formed and existing ones altered as research requirements change.

The Center and other population groups within the Institute also are advised by the Population Research Advisory Committee, made up of experts in population and family planning from government agencies, universities, and private organizations.

Grants

The Center's **Population and Reproduction Grants Branch** administers a large research and training grant program in reproductive biology and the behavioral sciences. A qualified investigator interested in applying for a research grant may contact the Branch for application forms

relationships between variables involved in social and demographic change


the determinants of population change
social, economic, and environmental variables
intervening variables directly affecting the demographic processes (e.g. contraceptives available, number of children wanted)
population size, structure, and distribution
demographic processes (births, deaths, migration)
the consequences of population change

Research must specify in increasingly greater detail the relationships between each of the four quadrants (above), in order to develop an understanding on which to base rational policies dealing with population problems.

and staff assistance. Applications undergo a review process taking about six months.

All applications are first forwarded to the Division of Research Grants, NIH, for assignment to an appropriate funding Institute or Division of NIH and to a Study Section. Study Sections review the applications for scientific merit, qualifications of the investigator, proposed methodology, facilities available at the sponsoring institution and adequacy of the budget. Study Sections are composed of experts selected for their wide experience and contributions to research in particular scientific disciplines.

Final review is provided by the National Advisory Child Health and Human Development Council, which meets three times a year. Similar to the other 16 Advisory Councils at NIH, the NACHHD Council is composed of about 15 scientists, professionals and prominent laymen who have special knowledge of research, education or public affairs.

Most research grants are awarded to an institution in behalf of a principal investigator for a discrete research project. In recent years, the NICHD has also awarded Program Project Grants, which support a number of investigators and their related projects at a single institution.

Training

The training of investigators to conduct population research is supported at predoctoral and postdoctoral levels. Trainees must be citizens or permanent residents of the United States. Training grants are

awarded to professional and graduate schools, hospitals and eligible clinics. The grant monies are used by these institutions to support approved training projects and individuals. The trainees can receive financial support in the form of stipends, dependency allowances, tuition and travel. The NICHD also awards various types of fellowships to individuals in research institutions for a year or more of research training. For application forms and additional information about the training program, write the Training Officer, Population and Reproduction Grants Branch, Center for Population Research.

In its own clinics and laboratories the Institute offers learning opportunities to young investigators through NIH Staff Fellowships, awarded initially for a two-year period to candidates with a doctoral degree. Applications and further information may be obtained from the Director, National Institute of Child Health and Human Development, National Institutes of Health, Bethesda, Maryland 20014.

Training and experience in the Institute's research facilities are also available to physicians appointed as Clinical, Research, or Staff Associates. Selections are usually made two years in advance, and draft eligible physicians are deferred for one or more years of residency training before serving two years on active duty with the Public Health Service Commissioned Corps. Information about this program, called the Commissioned Officer Residency Deferment (CORD) Program, may be obtained by writing the Chief, Clinical and Professional Education, National Institutes of Health, Bethesda, Maryland 20014.

Federal Leadership Role

A number of Federal agencies support activities broadly defined as population research. Among them:

- Agency for International Development
- Bureau of the Census
- Department of Health, Education, and Welfare
  - National Institutes of Health
  - National Institute of Mental Health
  - National Center for Health Statistics
  - National Center for Family Planning Services
  - Food and Drug Administration
  - National Center for Health Services Research and Development

Coordination of Federal efforts and exchange of information and expertise among agencies became imperative as Federal expenditures for population research rose dramatically in answer to the population problem. The Center for Population Research became responsible for giving new energy and direction to the wide-ranging Federal effort in areas bearing on population.

Through its **Program Liaison Branch,** the Center works with

- the Offices of the Directors of NIH and NICHD
- the Office of the Assistant Secretary for Health and Scientific Affairs, DHEW

Studies of the early blastocyst before implantation are part of a large research program in reproductive biology. This sheep blastocyst (embryo), composed of approximately 32 cells, is shown at 96 hours developmental age.

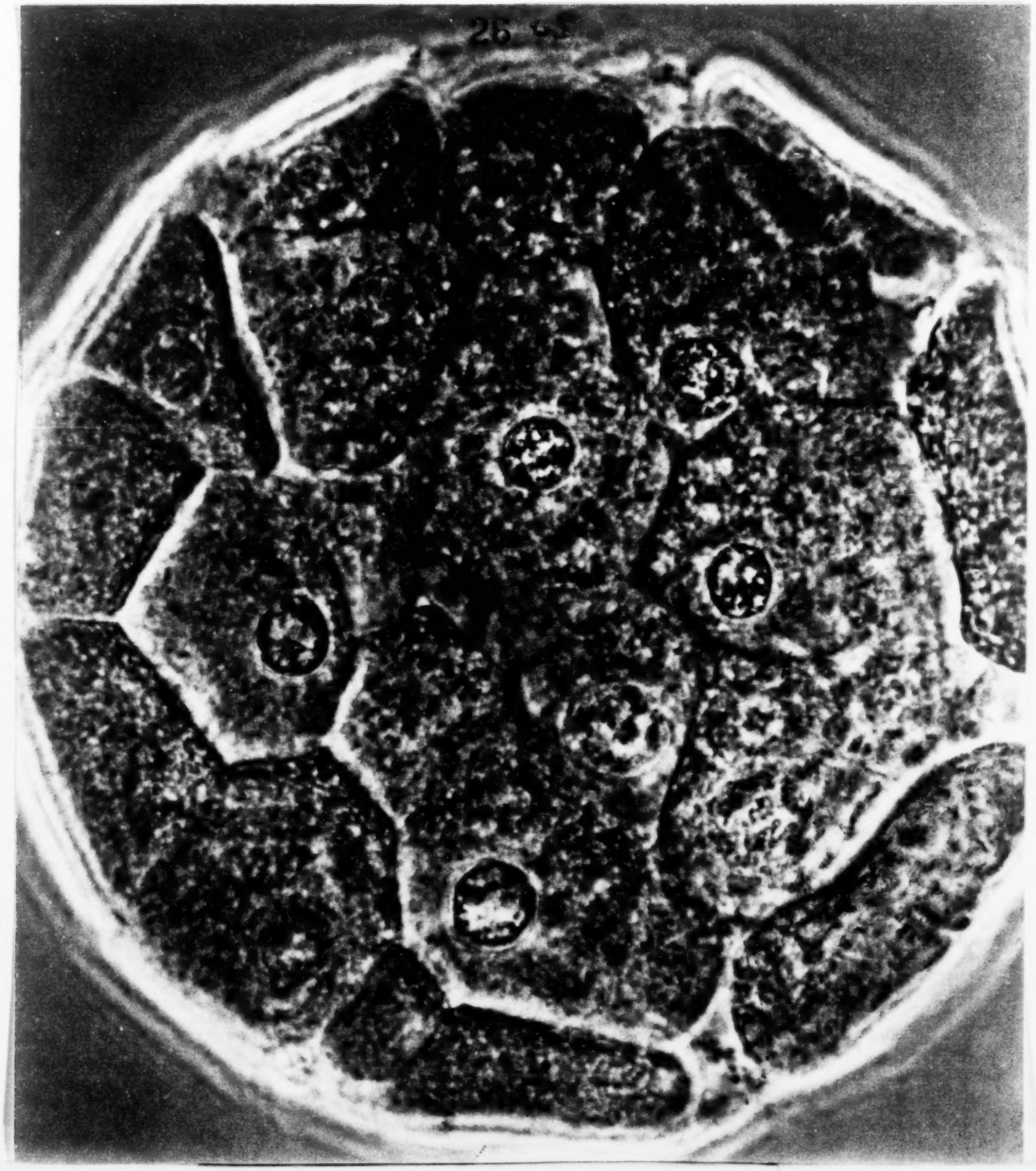

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Figure 1

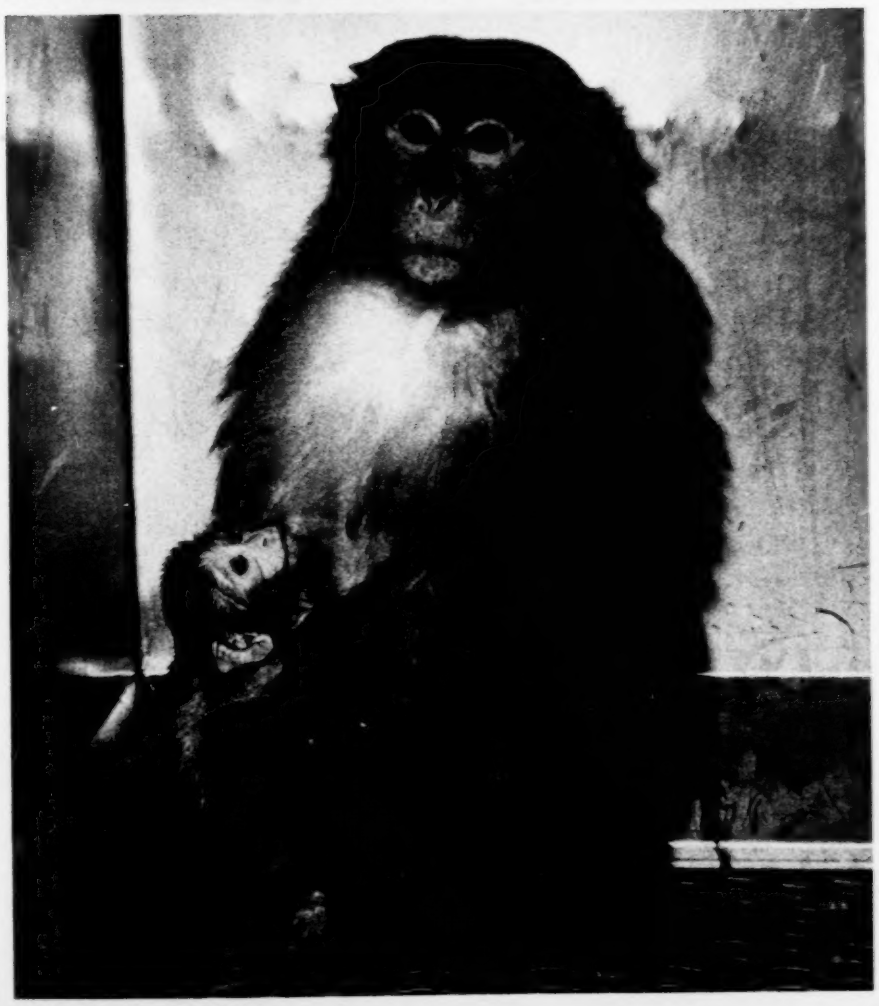

Figure 2

Fig. 1. At NICHD laboratories in Bethesda, Maryland, scientists are establishing a breeding colony of rhesus monkeys whose histories and geneologies are known. These one-year-old macaques will be bred when they reach maturity.

Fig. 2. This female rhesus monkey and her five-day-old baby are being observed and tested at the NICHD for information on reproduction and sexual development in primates. During pregnancy, the female's hormones, excreted in the urine, were collected as part of a study of hormone changes during gestation. The baby will receive injections to test the changing responsiveness of his reproductive tissues to pituitary hormones as he matures.

- the Population Research Committee, DHEW
- the Federal Council for Science and Technology
- principal private and international agencies in population, such as the Ford Foundation, Population Council, Rockefeller Foundation, Planned Parenthood-World Population, International Planned Parenthood Federation, and World Health Organization

P.L. 480 Program

The Center for Population Research supports collaborative research in population between a U.S. project officer and a foreign investigator under the Special Foreign Currency Program (P.L. 480) of the U.S. Public Health Service. For these projects Congress specifically earmarks foreign funds created by U.S. sale of surplus foods to developing countries. The Center reviews needs and resources of individual countries, taking into account the efforts of other Federal, international, and private organizations in population research.

the reproduction research branch

This intramural program encompasses several areas of research important to reproductive biology. The scientific interests range from the study and isolation of protein hormones to model experiments in primates and clinical studies in man.

Some projects of the Branch are

- developing methods for using monkeys as models for studying human reproductive processes
- describing the function and regulatory mechanism for the human ovary
- explaining how IUDs work in rhesus monkeys
- purifying and studying the protein hormones controlling the ovary and testis
- analyzing how oral contraceptives and their components work in women

other institute activities

The NICHD's population activities also include

- exploration of menstruation, ovulation, and hormone function through continuation of a 36-year study of the menstrual cycle
- statistical consultation for Center contracts
- preparation of bibliographies, surveys of current research, and publication of an abstract journal
- a public information program.

For more detailed information on any of the topics mentioned in this booklet, contact the Center for Population Research, National Institute of Child Health and Human Development, National Institutes of Health, Bethesda, Maryland 20014, telephone (301) 496-1101.

The Institute staff welcomes inquiries on its own and other Federal programs.

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